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Site Description and Tasks

Pristine Superfund Site Battle Creek, Michigan

PHASE II September <del>12</del> 24, 2018 (rev. 1)

Period of Performance (Date of Award - April 30, 2019)

### Site Description

The Pristine, Inc. Site occupies approximately three acres and is located in an industrial area within the City of Reading, Hamilton County, Ohio. The Site is underlain by the Mill Creek bedrock valley. Mill Creek eventually empties into the Ohio River. The lower outwash aquifer above this bedrock valley contains the majority of the contaminant plume and flows to the south-southwest. It was formerly the primary source of water supply for the area, including the water supply for the City of Reading. There is a separate upper aquifer in some parts of the bedrock valley, but below the Site, groundwater is present only in a number of interconnected lenses above the lower outwash aquifer. Mill Creek flows from north to south approximately 600 feet west of the Site. Mill Creek is not used for drinking or recreation other than for occasional fishing.

## **History of Contamination**

The Site was used as a liquid waste disposal facility from 1974 to 1981. Prior to 1974, the Site had been used for the manufacturing of sulfuric acid and fertilizer. In 1977, Pristine, Inc. obtained a permit to incinerate liquid waste on-site and accepted both bulk and drummed waste for incineration. The Site was closed in 1981 due to numerous permit violations and, at the time of closure, more than 10,000 drums and several hundred thousand gallons of bulk liquids were on-site. The chemicals of concern have included the following:

- Polychlorinated biphenyls (PCBs);
- Pesticides such as dichlorodiphenyltrichloroethane (DDT), Aldrin and dieldrin;
- Volatile Organic Compounds (VOCs) such as 1,2-dichlorethane, methylene chloride, chloroform, benzene, vinyl chloride, tetrachloroethylene and trichloroethylene (TCE);
- Semi-volatile organic compounds (SVOCs) such as polycyclic aromatic hydrocarbons (PAH), phenol and bis(2-ethylhexyl)phthalate;
- · Metals such as cadmium, lead and mercury; and
- 2,3,7,8-tetrachlorodibenzodioxin (TCDD) in the Pristine incinerator ash.

From 1980 to 1983, most of the drummed material was removed under a Consent Decree (CD) between Ohio EPA and Pristine, Inc. In September 1983, the Site was formally added to the National Priorities List.

In 1984, sludge's and highly contaminated soils were removed from the Site under an Administrative Order on Consent between EPA and a group of private parties. The removal actions taken from 1980 through 1984 addressed the immediately hazardous Site conditions but

did not address the long-term risks associated with contamination in the subsurface soils or groundwater.

**Basis for Taking Action** 

In 1984, EPA initiated a Remedial Investigation and Feasibility Study (RI/FS) to define the extent and magnitude of the remaining contamination at the Site, to characterize threats to human health and the environment, and to evaluate remedial alternatives. The RI included sampling of surface and subsurface soils, incinerator residues, sediments, surface water, and groundwater. The sampling results showed that the subsurface soils and Site groundwater were highly contaminated. The RI/FS demonstrated that the potential human health risk from contact with contaminated soils and groundwater was unacceptable. In addition, the potential for migration of groundwater contamination from the Site presented an unacceptable potential risk of contamination to the City of Reading water supply.

### **Remedy Selection**

On December 31, 1987, EPA issued a Record of Decision (ROD) that addressed contaminated soil and groundwater.

The remedial action goal for soil was defined as the adequate protection of the environment and public health from inhalation, absorption, or ingestion of potentially hazardous substances. The remedial action goal for groundwater was defined as the adequate protection of public health from inhalation (of vapors), adsorption, or ingestion of potentially hazardous and carcinogenic substances. The selected remedy consisted of the following components:

- Excavation and on-site consolidation of 1,725 cubic yards of sediment and soil;
- · In-situ vitrification of contaminated soil to an average depth often feet across the Site;
- Installation of a French drain along the eastern Site boundary;
- Extraction of groundwater from the lower outwash lens/lower aquifer using at least one extraction well;
- · On-site treatment of groundwater using an air stripper with discharge to Mill Creek;
- · Demolition, decontamination and removal of all on-site structures;
- · Access and deed restrictions; and
- · Groundwater monitoring

#### Remedy Implementation

Construction of the remedy for the Pristine, Inc. Site was conducted in five phases. The first phase, demolition of on-site structures, was described in the 1987 ROD and completed in January 1992. During the demolition, a large portion of the metal from the facility was decontaminated and recycled. Debris from the facility demolition was disposed off-site in an EPA-approved landfill.

The second phase, thermal treatment of soil by thermal desorption technology, was incorporated into the remedy in the 1993 ESD, and conducted in 1993 and 1994. Approximately 13,000 tons of contaminated soil were treated and placed back on-site. The treated soil was delisted prior to on-site placement. Extensive compliance testing occurred during the operation of the thermal

desorption unit, and compliance was maintained throughout the life of the project.

The third phase, conducted in 1994 through 1998, was initiated with the 1990 ROD Amendment and included construction of an ISVE system and cap. The ISVE system contains a series of trenches and wells to remediate the soil and groundwater in the upper zones of the Site. The ISVE system removes approximately 5 gallons per minute (gpm) of groundwater and 1,000 cubic feet per minute of soil gas for subsequent treatment. The ISVE system was constructed by 1996 but did not initiate operation until October 1997, when the 150 gpm pump and treatment system initiated operation. EPA issued a second ESD in April 1996 that waived Ohio's and degradation discharge rule (OAC 3745-1-05), based on a determination that it would be technically impracticable to achieve the anti-degradation-based discharge limits for discharge to Mill Creek from the treatment system. The ISVE system was expected to operate for up to 10 years.

The fourth phase, construction of the 150 gpm pump and treatment system, was conducted in 1997 and started operation in October 1997. The 1987 ROD defined the remedy as including a groundwater extraction and treatment system. The 150 gpm system treats groundwater extracted from on-site lower aquifer extraction well (EW), EW1 (30-35 gpm), the ISVE shallow groundwater

system (5 gpm), and off-site, lower aquifer extraction wells, EW2 (35 gpm) and EW3 (80 gpm).

The fifth and final phase, construction of the 300 gpm system, was conducted in 1998 and initiated operation in October 1998. The 300 gpm system expanded the existing pump and treat system, and was designed to clean up and treat groundwater from the lower aquifer farther downgradient from the Site. While the system was being constructed, an extensive investigation was conducted to delineate the contamination within the lower aquifer. The 300 gpm system includes extraction wells EW4 (150 gpm) and EW5 (150 gpm).

Groundwater pumped and treated in the 300 gpm system is combined with the treated groundwater from the 150 gpm system and discharged to Mill Creek. The combined discharge was designed to meet final effluent limitations and monitoring requirements.

In March 2002, at the request of EPA, the Pristine Trust lowered the overall groundwater pumping rate from 450 gpm to 375 gpm. EPA requested this pumping rate reduction because the pump and treat system had been drawing in unrelated TCE contamination from a plume southwest of the Site, as well as cis-1,2-dichloroethene contamination west of the Site from a G.E. facility undergoing corrective action under the Resource Conservation and Recovery Act. In January 2006, EPA approved the Pristine Trust's Preliminary HHRA. EPA requested that the Pristine Trust perform this risk assessment because one of the findings of the 2001 FYR was that certain chemicals such as vinyl chloride were found in the soil but did not have cleanup standards identified in the ROD. For future industrial and construction worker pathways and for current and future trespasser pathways, the Preliminary HHRA concluded that there is no significant risk from on-site soil. The Preliminary HHRA will be finalized after soil VOC concentrations have been verified after the ISVE system is shut down.

In March 2006, EPA approved a second groundwater pumping rate reduction from 375 gpm to

150 gpm, due to a VOC plume from the G.E. facility west of the Site. At 375 gpm, the zone of influence for the Pristine pump and treat system had extended to the area of the G.E. plume. In September 2006, EPA issued the third FYRR for the Site. The 2006 FYR concluded that the remedy was protective of human health and the environment. It also stated that the Site will be protective in the long term when groundwater and soil cleanup standards are achieved, additional ICs that run with the land have been implemented, and assurances exist that ICs are monitored.

In November 2008, EPA approved a reconfiguration of the groundwater extraction system to minimize interference from off-site, lower aquifer groundwater plumes that EPA does not consider to be Site-related. In August 2009, EPA approved the deactivation of Air Stripper IA in the groundwater pump-and-treat plant.

In October 2009, EPA approved a temporary shutdown of the ISVE system. The Pristine Trust requested this shutdown to determine if soil vapor levels will increase when the system is not operating. EPA will determine whether to re-start the system based on reviewing a sufficient amount of soil vapor data.

In November 2010, EPA approved the Pristine Trust's Monitored Natural Attenuation (MNA) Pilot Program Work Plan, and initial implementation began shortly thereafter. The MNA Pilot Program includes deactivating all off-site, lower aquifer extraction wells and treating only the on-site groundwater pumped at an unchanged rate of 50 gpm. It will inform a decision as to whether MNA should become a component of the remedy, along with the existing pump and treat system, to remediate groundwater. In evaluating whether MNA is suitable for a Site, EPA will consider six criteria that must be satisfied:

- 1. The plume must be demonstrated to be stable or shrinking;
- 2. Risks associated with leaving the plume in place must be defined;
- 3. Stability of flow in aquifer must be demonstrated;
- 4. The nature and extent of contamination must be fully defined in three dimensions;
- 5. Control of the source must be demonstrated; and
- 6. Contaminated groundwater should be returned to beneficial use within a reasonable time frame compared with other alternatives.

In April 2015, Pristine Trust submitted the Interim MNA Report. In January 2017, EPA completed the review and concluded the MNA Pilot did not demonstrate MNA is occurring sufficiently. In April 2017 issued addition comments and data. EPA's response was preempted by the October 2017 request for meeting. In February 2018, EPA meet the Pristine Trust to discuss potential application of MNA for the off-site 1,2-DCA plume area. The Trustees provided EPA an overview of the site setting, groundwater use, regional contamination, technical challenges, and related information that supports MNA for the off-site 1,2-DCA plume. EPA and SSPA, summarized the degree of MNA and risk of migration of the plume. Pristine Trustees believe the concept of a hybrid approach (enhanced) for MNA with groundwater gradient control was introduced by SSPA at the meeting and are willing to investigate and undertake this approach.

It is anticipated that the Pristine Trust will be submitting a proposed augmentation of the Site's remedy that may include Monitored Natural Attenuation (MNA) Program. This proposed augmentation of the Site's remedy will need review.

In May 2018, EPA was presented a proposal from the Trustees as follows:

...the southernmost extraction well, EW5, would be used to withdraw for treatment groundwater at a rate of approximately 50 GPM. This rate was selected based on the shallow gradient conditions observed to the south of EW5 prior to cessation of off-site pumping in 2011, when EW5 was operating at around 85 GPM. Although the proposed 50 GPM rate is expected to mitigate plume migration, the potential for drawing in regional contamination through pumping will still exist. Monitoring would be conducted to determine hydraulic response and changes in VOC concentrations at the 50 GPM rate over time, consistent with existing procedures. Adjustments to the pumping rate would be undertaken depending on the water level information, with the objective of controlling the gradient, while minimizing potential effects from regional contamination.

... the Trustees anticipate that EW5 pumping and monitoring would continue for up to 2 years, at which time an assessment would be made with recommendations for next steps, including possibly continuing EW5 pumping or terminating EW5 pumping for ultimate transition to MNA.

#### GENERAL REQUIREMENTS

#### PHASE I [COMPLETE]

- A thorough review of the past hydrogeologic studies and monitoring reports and a confirmation or an updating of the site conceptual hydrogeologic model and current status of remedy progress is needed. This requirement utilizes contract Task 2.A.3, and will result in a Draft Report due 75 days from request, and a Final Report incorporating EPA's comments within 30 day of receipt of comments.
- Analyze the groundwater contaminate conditions nature and extent and determine changes over-time and determine 3D plume stability. Include data gap analysis that may limit what site performance conclusions can be determined with existing available data. This requirement utilizes contract Task 2.A.2 and Task 2.A.3, and will result in a Draft Report due 75 days from request, and a Final Report incorporating EPA's comments within 30 day of receipt of comments.
- 3) Develop series of water level maps that better incorporate localized data such as the various pumping conditions, the river, the buried bedrock channel, stagnant flow conditions in middle of site and other site specific conditions. This requirement utilizes contract Task 2.A.1, and will result in a Draft Report due 75 days from request, and a Final Report incorporating EPA's comments within 30 day of receipt of comments.

- 4) Determine the temporal area of capture for the current remaining extraction well. Include any effects from the GE groundwater contaminant extraction occurring next-door. This requirement utilizes contract Task 2.A1 and Task 2.A3, and will result in a Draft Report due 75 days from request, and a Final Report incorporating EPA's comments within 30 day of receipt of comments.
- 5) Determine past temporal areas of capture for the extraction well system during the four different pumping-rates scenarios. This requirement utilizes contract Task 2.A.3, and will result in a Draft Report due 75 days from request, and a Final Report incorporating EPA's comments within 30 day of receipt of comments.
- Review and evaluation of extraction well shut-down reports and existing remedial action performance and system optimization reports will be needed to determine an effective and cost efficient remedy continuation. This requirement utilizes contract Task 2.A.3 and Task 2 A.2, and will result in a Draft Report due 75 days from request, and a Final Report incorporating EPA's comments within 30 day of receipt of comments.
- 7) Determine performance of the MNA pilot. This requirement utilizes contract (Task 2.A.3), and will result in a Draft Report due 75 days from request, and a Final Report incorporating EPA's comments within 30 day of receipt of comments.
- Review the existing groundwater flow models and update as required to be used to determine remedy performance and evaluate extraction well shut-down request. Compare site flow model(s) to the model being used by the G.E. Environmental Site next-door that is also extracting groundwater. This requirement utilizes contract Task 2.A.4, and will result in a Draft Report due 75 days from request, and a Final Report incorporating EPA's comments within 30 day of receipt of comments.
- 9) Review provide comments on any new and/or forthcoming groundwater monitoring reports will be needed. This requirement utilizes contract Task 2.A.3 and Task 2.A.2, and will result in a Draft Report due 60 days from request, and a Final Report incorporating EPA's comments within 30 day of receipt of comments.
- 10) It is anticipated that up to three meetings involving travel or site visits may be required.

#### PHASE II

- 1) Review any recent hydrogeologic studies and monitoring reports and a confirmation or an updating of the site conceptual hydrogeologic model and status of remedy progress if needed. This requirement utilizes contract Task 2.A.3, and will result in a Technical Memo due 60 days from request.
- Analyze the RP proposed augmentation of the Site's remedy to determine effects on groundwater contaminate conditions nature and extent and determine changes overtime and determine 3D plume stability. This requirement utilizes contract Tasks 2.A.3 and 2.A.4 and will result in a draft Technical Memo due 60 days from request, and a final Technical Memo incorporating EPA's comments within 30 days of receipt of comments.
- 3) Review RP's plan to resolve the data gap delineated in Phase I. This requirement utilizes contract Task 2.A.2, and will result in a Technical Memo due 60 days from request.
- 4) Use the mapping tools developed in Phase I, for mapping of new of water level maps, as required, that better incorporate localized data such as the various pumping conditions of the two localized municipal drinking water extraction systems, the river, the buried bedrock channel, apparent eastward flow conditions in along the eastern boundary of the landfill, the depth of leachate and other site specific conditions. This requirement utilizes contract Task 2.A.1 and will result in a Technical Memo due 60 days from receipt of data.
- Determine expected temporal (separate & combined) areas of capture for the current two localized municipal drinking water extraction systems based on the RP proposed augmentation of the Site's remedy. This requirement utilizes contract Task 2.A.3 and will result in a draft Technical Memo due 60 days from request, and a final Technical Memo incorporating EPA's comments within 30 days of receipt of comments.
- Determine expected performance of Monitored Natural Attenuation (MNA) as a remedy based on RP proposed augmentation of the Site's remedy. This requirement utilizes contract Task 2.A.3 and will result in a draft Technical Memo due 60 days from request, and a final Technical Memo incorporating EPA's comments within 30 days of receipt of comments.
- 7) If requested by EPA, use the existing groundwater flow models updated in Phase I as required to be to determine remedy performance and evaluate the RP's proposed augmentation of the Site's remedy. This requirement utilizes contract Tasks 2.A.1, 2.A.2 and 2.A.3 and will result in a Technical Memo due 60 days from request.
- 8) Provide results of new analysis in the existing Web-based GIS tool developed in Phase I. This requirement utilizes contract Tasks 2.A.1 and 2.A.3 and will result in a web-based Map due 60 days from request.
- 9) It is anticipated that up to six conference call meetings with the RP's contractor may be required.

# Optional\* Tasks

- 1) Review four periodic groundwater monitoring reports that RPs are required to submit throughout the year. This requirement would utilize contract Tasks 2.A.5 and will result in Technical Memos due 60 days from request.
- Provide comprehensive detailed written report on the review of one additional RP developed Remedy Effectiveness and Remedial Progress report that may be submitted including reviewing the results of RP's analysis of the proposed augmentation of the Site's remedy. This requirement would utilize contract Task 2.A.5, and will result in a Draft Report due 75 days from request, and a Final Report incorporating EPA's comments within 30 day of receipt of comments.
- 3) Three meetings or site visits involving travel with the RP's contractor may be required.

#### U.S. EPA PRIMARY CONTACTS

The technical point of contact for this work is David Linnear. He can be reached at (312) 886-2014, via facsimile at (312) 353-1252, or via e-mail at linnear.david@epa.gov. His mailing address is U.S. EPA Region 5, 77 West Jackson Blvd., Mail Code: SR-6J, Chicago, IL 60604.

The Contracting Officer's Representative is Matthew Hoory. He can be reached at (312) 886-0254 or via e-mail at hoory.matthew@epa.gov. His mailing address is U.S. EPA Region 5, 77 West Jackson Blvd., Mail Code: SE-5J, Chicago, IL 60604.

# **MAJOR DELIVERABLES**

A summary of the potential major tasks or deliverables are included below.

# PHASE II

TASK No.	TASK/ DELIVERABLE	PLANNED DELIVERY DATE
2.A.1	Mapping Hydraulic Gradients: 4) Hydraulic gradient analysis Technical Memo	60 days from receipt of data.
	8) Web-based Map	60 days from request.
2.A.2	Optimizing Groundwater Monitoring Networks: 3) Technical Memo on resolving data gaps	60 days from request.
2.A.3.	Evaluating Remedy Effectiveness and Remedial Progress:  1) Technical Memo on updated modeling and status of remedy progress.  5) draft Technical Memo on areas of capture	60 days from receipt of request. 60 days from request
	final Technical Memo on areas of capture  6) draft Technical Memo on MNA expected performance final Technical Memo on MNA expected performance	30 days from comments 60 days from request 30 days from comments
	7) Technical Memo detailing the analysis methods and results of the analysis.	60 days from receipt of request
2.A.4.	Optimizing Remedial Actions: 2) Technical Memo detailing the analysis methods and results of the analysis. Electronic files of results as described in Task description.	Draft Memo due 60 days from request Final Memo within 30 days of receipt of comments.
*2.A.5.	Review and Comment of EPA Region 5 Reports (Optional Comments 1): Technical Memos on review of 4 periodic groundwater monitoring reports.	60 days from request.
*2.A.5.	Review and Comment of EPA Region 5 Reports (Optional Report Review 2): Evaluate one RP report that includes Remedy Effectiveness and Remedial Progress detailing the analysis methods and results of the analysis	Draft Report due 75 days from request Final Report within 30 days of receipt of comments.